ASSIGNMENT 5

Textbook Assignment: "Milling Machines and Milling Operations," chapter 7.

5-1. When only one type of knee and column milling machine can be installed. It will usually be what type?

1. Bed
2. Vertical spindle
3. Universal
4. Plain

5-2. A universal milling machine has what main advantage over the vertical spindle and plain type?

1. The table moves in two directions
2. The table swivels on the saddle
3. The construction is more rigid
4. The spindle is on a horizontal axis

5-3. What milling machine is the most efficient for taking deep cuts at rapid rates of feed and speed?

1. Plain
2. Universal
3. Universal with a high-speed vertical milling attachment
4. Vertical spindle

5-4. The spindle can be fed into the work on what type of milling machine?

1. Universal
2. Plain
3. Bed
4. Vertical spindle

IN ANSWERING QUESTIONS 5-5 THROUGH 5-8, MATCH EACH COMPONENT IN COLUMN A WITH ITS DESCRIPTION IN COLUMN B.

A. COMPONENTS		B DESCRIPTIONS
5-5.	Column	1. The support for the table and saddle
5-6.	Knee	
5-7.	Saddle	2. A movable support to which the workpiece is fastened
5-8.	Table	
		3. Used to position the work closer to, or farther from, the column
		4. The main casing

5-9. The cutting tool of a milling machine is driven by what component?

1. A work holder
2. The overarm dovetail
3. An arbor support
4. The spindle

5-10. The size of a milling machine is determined by what factor?

1. The height of the main casing in feet
2. The longitudinal table travel in inches
3. The length of the table in inches
4. The surface area of the table in feet

5-11. Which of the following vises provides the least rigidity?

1. Swivel
2. Plain
3. Toolmaker's universal
4. Plain flanged swivel

5-12. The outer end of an arbor is aligned with the spindle by what milling machine component?

1. The overarm
2. The column
3. The knee
4. The arbor support

5-13. The base of a rotatable toolmaker's knee is graduated in what increments?

1. Degrees
2. Seconds
3. Inches
4. Thousandths of an inch

5-14. What milling machine attachment is used to hold stock being machined into a gear?

1. A swivel vise
2. A universal vise
3. A dividing head
4. A center rest

5-15. When cutting a helical gear, the shortest lead possible is provided by what drive mechanism?

1. The low lead drive
2. The long and short lead drive
3. The enclosed driving mechanism
4. The helical drive unit

5-16. Rapid indexing is accomplished by what means?

1. An index head sector
2. A direct index plate
3. A universal dividing head
4. A compound index plate

5-17. Eight complete turns of the index crank will move a universal dividing head spindle what fraction of a revolution?

1. 1/40
2. 1/8
3. 1/5
4. 1/3

5-18. You are given a piece of work to divide into 12 parts and you have a 24-hole index plate available. To make each division, you should revolve the index crank on the index plate what amount?

1. 1 complete turn and 3 holes
2. 1 complete turn and 8 holes
3. 3 complete turns and 3 holes
4. 3 complete turns and 8 holes

5-19. You are given a piece of work that is to be divided into 960 parts and you have a 24-hole index plate available. To make each division, you should revolve the index crank on the index plate what amount?

1. 1 hole
2. 2 holes
3. 6 holes
4. 12 holes

5-20. You are using a 27-hole index plate. To move the circumference of the work ll°, you should turn the index crank what amount?

1. 1 turn and 2 holes
2. 1 turn and 4 holes
3. 1 turn and 6 holes
4. 1 turn and 8 holes

5-21. You are using a 21-hole index plate. To move the circumference of the work 180 minutes, you should turn the index crank what number of holes?

1. 6
2. 7
3. 3
4. 9

5-22. You are differental indexing for 72 divisions. Your selected number is 10. In a 21-hole circle index plate, you should turn the index crank what number of holes?

1. 8
2. 2
3. 12
4. 4

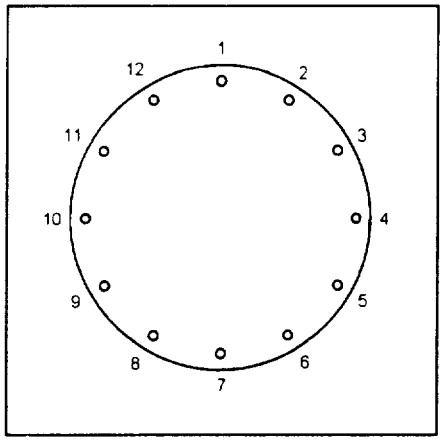

Figure 5A.--12 hole circle.

IN ANSWERING QUESTION 5-23, REFER TO FIGURE 5A.

5-23. Five holes are required for indexing and the index pin is inserted into hole 1. In a 12-hole circle, what hole should be covered by the right arm of the index sector?

1. Hole 5
3. Hole 6
3. Hole 7
4. Hole 8

5-24. Plain milling cutters have what principal characteristic?

1. They have teeth on the circumference only
2. They have only straight teeth
3. They always have helical teeth
4. They have teeth on the end only

5-25. Cutters are attached to what part(s) of a milling machine?

1. A plain arbor or arbor yoke
2. A screw arbor
3. A collet or adapter
4. An arbor or directly to the spindle

5-26. What type of cutter is ground thinner toward its center to provide clearance between the cutter and the work?

1. A plain milling cutter
2. A side milling cutter
3. A metal slitting saw
4. A shell and mill

5-27. What type of cutter can be used in pairs to mill slots?

1. Half-side milling cutters
2. Side milling clutters with interlocking teeth
3. Metal slitting saws
4. Half-side milling cutters with a metal slitting saw between

5-28. Dovetail ways are cut with what type of milling cutter?

1. A side milling cutter
2. A metal slitting saw
3. A slotting cutter
4. An angle cutter

5-29. Shell end mills usually have what type of teeth?

1. Straight
2. Helical
3. Concave
4. Convex

5-30. What type of end mill can be fed into the work like a drill?

1. Shell
2. Two-flute
3. Multiple-flute
4. Convex

5-31. Woodruff keyseat cutters less than 1/2 inch in diameter usually have a/an

1. arbor
2. shank
3. stub arbor
4. arbor support

5-32. What type of cutter can be manufactured locally to cut a variety of forms?

1. A fly cutter
2. A corner-rounding cutter
3. A convex cutter
4. A gear hub

5-33. For milling thin material, you should select what type of cutter?

1. Coarse-tooth
2. Fine-tooth
3. Straight
4. Helical

5-34. Before you tighten or loosen the arbor nut, what milling machine component must be in place?

1. The saddle
2. The trip dog
3. The feed dial
4. The arbor support

5-35. Plain milling is the process of milling a flat surface in a plane parallel to the cutter axis.

1. True
2. False

5-36. When setting up a milling machine, you should determine that the surface of the work is just touching the teeth of the cutter by what method?

1. Insert a thin feeler gauge between the teeth of the cutter and the work
2. Raise the work until the cutter stops it, then back off slightly
3. With the cutter turning slowly, bring the work up until it stops the cutter
4. With a piece of paper on the work surface, raise the work until the rotating cutter pulls the paper

5-37. When face milling, you should feed the work so the cutter thrust will force the work in what direction?

1. Down
2. Up
3. Left
4. Right

5-38. Which of the following cutters is NOT used for face milling?

1. Face milling cutter
2. Straight-shank end mill
3. Slotting cutter
4. Shell end mill

5-39. You are milling using an indexing head with a screw-on chuck. In what direction should the cutter rotary thrust be applied to the chuck?

1. Toward the index head
2. So it will tighten the chuck
3. Toward the column
4. To the left

5-40. What is the largest hexagon you can cut from a 2-inch piece of round stock?

1. 1.414 in.
2. 1.732 in.
3. 2.000 in.
4. 3.110 in.

5-41. What is the largest square you can cut from a 3-inch piece of round stock?

1. 1.732 in.
2. 2.110 in.
3. 2.121 in.
4. 2.598 in.

5-42. The cutter should be as close as possible to the column of the milling milling machine for what reason?

1. Rigidity
2. Clearance
3. Machinability
4. Maximum speed

5-43. The rotary motion of a milling machine spindle is changed to a reciprocating motion by using what attachment?

1. Index head
2. Slitting saw
3. Slotting
4. Sawing

IN ANSWERING QUESTIONS 5-44 THROUGH 5-46, MATCH THE TYPE OF SLITTING SAW IN COLUMN A THAT SHOULD BE USED TO CUT THE MATERIAL IN COLUMN B.

A. SLITTING SAWS B. MATERIALS

5-44. Fine tooth
5-45. Coarse tooth
5-46. Staggered tooth

1. Brass
2. Thick steel
3. Thin steel sheet
4. Carbide

5-47. It is easiest to machine an external keyway on what machine?

1. Shaper
2. Milling machine
3. Jumping jack
4. Lathe

5-48. When you plan to use a fly cutter as a formed cutter, why should you rough out the surface with an ordinary cutter?

1. To obtain a smoother surface
2. To save time since the fly cutter is not as fast
3. To reduce the load on the fly cutter arbor
4. To increase the chip load

5-49. The cutting tools used for boring on a milling machine resemble what other type of cutter?

1. End mill
2. Shell end mill
3. Slot cutter
4. Fly cutter

5-50. The greatest variation in the angle at which the cutter can be set is provided by which of the following milling machine attachments'?

1. Universal milling
2. Compound vertical milling
3. Angular milling
4. Circular milling

5-51. The high-speed universal milling attachment can be swiveled what maximum number of degrees?

1. 90°
2. 180°
3. 270°
4. 360°

5-52. Carbide cutters can be operated at how many times the speed of high-speed cutters?

1. 6
2. 2
3. 3
4. 4

5-53. A 3/4-inch cutter that will be run at 65 fpm has what approximate spindle speed?

1. 248 rpm
2. 257 rpm
3. 331 rpm
4. 341 rpm

5-54. What is the approximate cutting speed of a 1 1/4-inch cutter running at 140 rpm?

1. 43.2 fpm
2. 44.3 fpm
3. 45.8 fpm
4. 46.9 fpm

5-55. What rates of speed and feed are best for roughing?

1. Low speed and low feed
2. Low speed and high feed
3. High speed and high feed
4. High speed and low feed

5-56. To mill a metal to a fine finish, you should use what cutter speed and feed?

1. High cutter speed and slow feed rate
2. Low cutter speed and high feed rate
3. Low cutter speed and slow feed rate
4. High cutter speed and high feed rate

5-57. When using a periphery milling cutter, you should apply the coolant to what area?

1. The point at which the tool leaves the work
2. On the work
3. The point at which the tool engages the work
4. The middle of the cutter